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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,484	10/16/2003	Larry D. Partain	005513.P016	2189

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VARIAN/BLAKELY  
12400 WILSHIRE BOULEVARD, SEVENTH FLOOR  
LOS ANGELES, CA 90025-1030

EXAMINER

KO, TONY

ART UNIT PAPER NUMBER

2878

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/688,484

Applicant(s)

PARTAIN ET AL.

Examiner

Tony Ko

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 8/28/06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 18, 19, 21, 23, 34, 36, 37, 39-46, 64-72 and 78-81 is/are rejected.
- 7) ☒ Claim(s) 11-17, 20, 22, 24-33, 35, 38, 47-63 and 73-77 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

1. This office action is in response to argument filed on 8/28/06. Currently claims 1-81 are pending.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1- 10, 18, 19, 21, 23, 34, 36, 37, 39-46, 64, 70-72, 78 – 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Granfors (U.S. Patent 6,353,654) in view of Sun (U.S. Patent 6,996,288).

1. Regarding claim 1-10, 18, 19, 21, and 23, Granfors discloses (See Figs. 1-4) a method comprising: estimating (Col 3, Lines 21-27) an excess signal based on a non-linear decay response (Fig. 4) of a measured signal of an image frame (Col. 3, Lines 15-16); and compensating for the excess signal in the image frame of an imaging system. Granfors also discloses the method comprising selecting a frame rate (Col. 7, Lines 36-38). Granfors also discloses the compensating for the excess signal in the imaging system is based on the frame rate (Col. 7, Lines 36 to Col. 8, Lines 3). Granfors also discloses comprising subtracting an estimation of the excess signal from the measured signal of the image (Col 7, Lines 60-61). That is, examiner understands the linear combination includes addition and subtraction. Granfors also discloses estimating the excess signal further comprises selecting a first reference image frame where the first reference image frame is a non-saturated exposed image frame (Claim 1).

Granfors also discloses the first reference image frame is a non-saturated lag image frame (Col. 6, Lines 8-11). Granfors also discloses the excess signal is estimated using a measured signal of the first reference image frame and an end of exposure time of a radiographic image, the first measured signal value corresponds to the measured signal at the frame time of the first reference image frame (Col. 7, Lines 36-43). Granfors also discloses estimating the excess signal further comprises selecting a second reference image frame (Col. 7, Lines 35-45). Granfors also discloses the second reference image frame is a lag image frame (Col. 7, Lines 35-67). Granfors also discloses the excess signal is estimated using the measured signal of the first reference image frame and a difference in time between the frame time of the first reference image frame and a frame time of the second reference image frame (Col. 7, Lines 35-67). Granfors discloses the invention set forth above. Granfors does not specifically disclose the use of a non-linear model to model the ghost image. Sun discloses (Col. 2, Lines 18-25) to model the image data with a non-linear model. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use non-linear model to model the retained signal to better compensate for the ghost image left in the detector.

2. Regarding claims 34, 36, 37, and 39, Granfors discloses (See Figs. 1-4) the subtracting (120) the estimation of the excess signal from the measured signal generates an estimated signal proportional to an integrated light intensity striking a photoconductor for a given integration time. Granfors also discloses the estimation of the excess signal is derived by integrating a smooth curve fit of experimentally derived excess signal data as a function of time (Col. 3 – Col. 8). Granfors also discloses the estimation of the excess signal is derived by using a theoretical model expression. Granfors also discloses the subtracting the estimation of the excess signal

from the measured signal further comprises subtracting the estimation of the excess signal from the measured signal on a capacitor (inherently in the imager) in the imaging system for a pixel for multiple frames. Granfors discloses the compensating for the excess signal in the image frame comprises determining an estimation of the excess signal in a non-linear range of operation of the imaging system (Fig. 4)

3. Regarding claims 40-46 and 65-69, Granfors discloses the invention set forth above; it is inherent that the excess signal could be a thin film transistor, a capacitor, a photodiode, a photoconductor, a leakage current, a dark current, a lag current. That is, these devices accrue charges that can't be removed completely during the reset operation, thus result in excess signal.

4. Regarding claims 64, 70-72, 78-79, 80 and 81, Granfors discloses (Fig. 2) an apparatus, comprising: an imager; and a processor coupled with the imager and configured to compensate for an excess signal in the imager based on a frame rate (Col. 7, Lines 35-42). Granfors also discloses the processor is configured to cause the compensation by subtracting (120) an estimation of the excess signal based on the frame rate (Col 7, Lines 35-42). Granfors also discloses the excess signal is a non-linear signal (Fig. 4). Granfors also discloses the processor is configured to estimate the excess signal over an integration time. Granfors in view of Sun also discloses the imager is a flat panel imager (Fig. 2). Granfors also discloses the imager comprises amorphous silicon photodiodes (Claim 5). Granfors also discloses an apparatus, comprising: means (36) for detecting an excess signal in an imager; and means (34) for compensating for the excess signal in the imager based on a frame rate at which the imager is operating (Col. 7, Lines 36 - 43, Fig. 2). Granfors also discloses means for receiving light (74); and means for generating an electric current in the imager proportional to the received light (74), wherein the electric

current includes the excess current, wherein the excess current is an integration of the excess current over the integration time.

### *Response to Arguments*

5. Applicant's arguments with respect to claims 1-81 have been considered but found not persuasive.

6. Applicant argues that Sun does not disclose the compensation for changes over time. Such language (changes over time) is not found in the claim thus the argument is found not persuasive.

### *Allowable Subject Matter*

7. Claims 11-16, 20-33, 35, 38, 47-63, and 73-77 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: prior art discloses the invention set forth above, prior art does not disclose calculating the excess signal as a function of an integration time. Prior art does not disclose the excess signal comprises calculating the excess signal as a function of an integration time. Prior art does not disclose calculating the excess signal using a power function. Prior art does not disclose estimating the excess signal further comprises selecting the excess signal from a look up table. Prior art does

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not disclose using a recursive function to estimate the excess signal. Prior art does not disclose the second reference image frame is a non-saturated exposed image frame.


*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Ko whose telephone number is 571-272-1926. The examiner can normally be reached on Monday-Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TKO



THANH X. LUU  
PRIMARY EXAMINER